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ABSTRACT

Presented are rules of sign language structure which have provided a framework for linguistic analysis in a project studying the acquisition of sign language by 10 deaf children of deaf parents. Two levels of rules are outlined: definition rules, which deal with definitions of terms used in the analysis and their relation to terms used in other language development studies; and translation rules, which establish principles for transcribing sign language using English glosses and for counting morpheme units in sign language. Rules are given for the following categories: basic components of sign language (such as signs, fingerspelling, and pointing), compound and complex signs, notation of diglossia, nonstandard constituents, utterance boundaries, and computational definitions. (LS)

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# The Parameters of Sign Language Defined:

## Translation and Definition Rules

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Research, Development and Demonstration
Center in Education of Handicapped Children
Minneapolis, Minnesota

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# Errata

Table of Contents:

| | | |
|---|---|---|
| line 11: | For "15" | Read "14" |
| line 13: | For "16" | Read "15" |
| line 16: | For "18" | Read "17" |
| line 21: | For "24" | Read "23" |

| | | |
|---|---|---|
| Page 3, Line 21: | For "author's" | Read "authors'" |
| Page 4, line 13: | For "phonetic" | Read "phonological" |
| Page 8 line 2: | For "deal" | Read "deals" |
| line 6: | For "establish" | Read "establishes" |

Page 15, line 9, TR9B:
For "TR 1 and TR 2 apply"
Read "TR2 applies"

Page 15, line 12, TR9B:
For "TR 2 and TR 3 do"
Read "TR 2 does"

Page 17 line 1, TR 11B:
For "TR 8" Read "TR 9"

Page 25 line 11, DR P:
For "TR 23" Read "TR 24"

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# The Parameters of Sign Language Defined: Translation and Definition Rules

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Researchers analyzing the sign systems of deaf individuals generally have translated signs into a spoken language for analysis (Tervoort & Verbeck, 1967; Bellugi, 1972; Schlesinger & Meadow, 1972). Winslow states (1973, p. 30) that many researchers "have managed to present their data in written form, but for the most part neglected to make their transcription rules explicit." The present paper provides guidelines for transcribing sign language using English glosses.

Certain terms and measures used in the description of spoken languages may be useful in describing sign language and its acquisition. The present paper, which emerges from a study of sign language acquisition by deaf children of deaf parents, also sets forth definitions and conventions which make it possible to apply these terms to sign language.

American Sign Language, the sign language used by the American deaf, is not a single, clearly defined language. Rather, the term encompasses a wide range of dialectal and idiolectal variants, differing in such factors as formality and degree of influence from English but united by a common "phonology" (cherology) and a large shared lexicon, and presumably by syntactic factors as well. In this paper, the term "sign language" includes the full range of

dialectal variants. If a given statement is not applicable to sign language as it is used by the majority of deaf Americans, this is so indicated.

Early studies of language acquisition analyzed child language in terms of the adult model (Slobin, 1971). Berko's (1958) study provided a viable alternative to this approach. She found that children abstracted rules from adult models but applied them through systems of their own, generating surface structures that adults did not produce.

The first words produced by children were found to be nouns, verbs, and adjectives that make reference, comprising a general or "open" class of words. Theories emerged which postulated that children's earliest two-word utterances result from a rudimentary syntax which involves the combination of members of a small set of restricted or "pivot" words with words from the larger, more varied "open" set (Braine, 1963; McNeill, 1966). Bloom (1970), among others, has demonstrated in recent years the inadequacy of the pivot-open approach. She showed that child language involves more than simply the co-occurrence of words on a syntactical level. The child's production of identical strings of words with different meanings in different contexts indicates that children have an insight into some of the semantic subtleties of word combinations. Analysis of children's language has now incorporated investigation of both semantics and syntax into a more complete description of language acquisition, dealing with the semantic relationships between words in a child's

utterances as well as the overt syntactic structure of the utterances (Bloom, 1971; Schlesinger, I. M., 1971a; Brown, 1973).

It has been theorized that there is an innate, universal capacity for language development (Lenneberg, 1967; McNeill, 1970) which governs the processes by which language is acquired. Thus, all children learning language progress through fairly predictable stages which seem to be similar for all children and for all languages (Brown, 1973, p. 59). The child, through interaction with adult language models, abstracts the general principles needed for production and comprehension of the language of the community. The child's interaction involves the imitation and reduction of adult utterances and the production of new utterances according to the rules he has abstracted. The adult often presents expanded versions of the child's utterances. The child refines his unconscious linguistic rules, increasing their complexity, until, by age four, he knows most of the "essential patterns of verbal interaction" (Vetter & Howard, 1971) of his society. Attainment of adult language is said to be complete by puberty (Lenneberg, 1967). It appears that any normal child can learn any language if raised in the appropriate linguistic environment.

## Review of the Literature

In late 1970, when this study began, there were, to the author's knowledge, no linguistic investigations of the sign language of deaf children of deaf parents in progress. Investigations of sign language previous to this time have been concerned with comparing the educational achievement of children who used signs with that of those who did not.

These investigations were usually limited to older deaf children, and the analysis of language was based on samples written by the children (Quigley & Frisina, 1961; Stuckless & Birch, 1966). Blanton, Odom and McIntyre's later study (1971) was experimental in nature and produced results not in terms of linguistic analysis, but in terms of language processing. They determined that the deaf showed better reading retention with material written in sign language word order than with material in conventional English word order, although they did not describe "sign order."

Stokoe (1960) first directed attention to the linguistic structure of American Sign Language (ASL). In Stokoe's analysis, sign language was reduced to elements (called cheremes) paralleling the basic phonetic units (phonemes) of vocal languages. Just as any spoken word can be described in terms of its constituent phonemes, any sign can be described in terms of its component cheremes. There are three categories of cheremes: tabula (abbreviated tab), or hand position in space; designator (dez), or hand configuration; and signation (sig), or hand movement (Stokoe, Casterline, & Croneberg, 1965). A sign ($TD^{S}$) can be described by stating its tab (T), dez (D), and sig (s) cheremes. A change in one or more of these three cheremic dimensions changes the sign. This system of analysis allows the language of signs to be transcribed through the use of a symbol for each possible tab, dez, or sig.

Much new information about sign language has resulted from recent studies. Stokoe has produced a number of articles describing the

sign order and structure used by deaf adults (Stokoe, 1969-70, 1970). McCall (1965), noting that the sample of sign language she analyzed contained many repeated structures, concluded that sign language does indeed have its own syntax and rules which govern its production. This is in agreement with Stokoe's assertion that sign language is a language in its own right (Stokoe, 1971).

In a comparison of sign and speech, Bellugi (1972) noted that although an individual needed the same amount of time to convey a given message in either speech or sign, the signed version contained fewer words (signs). She concluded that, although sign language lacks many of the syntactical markers of English, it conveys the necessary information by other means (Bellugi, 1972; Bellugi & Fischer, 1972). In another study (Bellugi & Siple, 1971) signs were presented serially with no contextual cues. It was found that in this short-term memory task, deaf individuals remembered signs according to the dimensions described by Stokoe (tab, dez, sig). This memory coding seemed to be comparable to that used by hearing people recalling words in similar context-free, short-term memory tasks. When hearing subjects were asked to listen to a taped list of words and then to recite the list as they recalled it, the most common errors involved additions, deletions, or substitutions at the phonemic level (i.e., means for beans, coat for coke, etc.). Similarly, when deaf subjects were asked to watch a filmed series of unrelated signs and then to repeat the list, errors were

generally cheremic. For instance, one subject recalled "tea" when "vote" had been signed; these signs have the same tab and dez but have different sigs. This suggests that, for rote short-term recall tasks, both speech and sign are coded according to comparable structural constituents, phonemes and cheremes.

In addition to their study of adults' use of sign language, which has included the exploration of sign verbs and of tense and aspect in sign (Frishberg, 1972; Fischer & Gough, 1971), Bellugi and her associates began an investigation of the sign language of deaf children of deaf parents. Preliminary reports have been completed on the development of questions and negation (Lacy, 1972 a,b).

Finally, Schlesinger (1971b) concluded that Israeli sign language has no agreed-upon structure among different signers. However, Bonvillian and Charrow (1972) question the results of this study. Since many Israeli signers have recently come from other countries, "Israeli sign language" is probably not yet a unified language system.

## Procedure

The procedures followed in this study were modifications of those of Brown and Fraser (1963). Equipment consisted of a Sony 3400 portable videotape recorder to film the visual language. The setting was always in the child's home. It was restricted to one area of the house being visited, due to lighting conditions and the weight of the machinery. The authors concur with Brown and Fraser's (1963) statement that the confined space did not restrict

collection of sample utterances.

Either the mother or one of the investigators acted as a playmate for the child. Data was gathered through observation of the linguistic interactions of adult and child.

In order to be included in the study, a child had to have an average loss of at least 70 db ISO in the better ear. These children would be unlikely to rely primarily on audition for communication. The parents had to be deaf or hard of hearing. Communication between parent and child had to be through sign language, or sign language plus speech. Using these criteria, ten deaf children of deaf parents were identified. For more complete information on procedures and information obtained, the reader is referred to Hoffmeister, Moores, and Best (1974).

## Definition and Translation Rules

Analysis of sign language data presents a unique problem. Sign language has no written form and cannot be transcribed using conventional phonological approaches. Since Stokoe's sign transcription system is cumbersome, each sign was translated into its closest English equivalent. The same English gloss was used for all occurrences of any given sign. The English gloss is merely a symbol for the sign; the sign is generally neither syntactically nor semantically equivalent to its English gloss.

Exact translation was seldom possible. Therefore, the rules described in this paper were developed to facilitate interpretation and analysis of the data.

Two levels of rules are involved in this analysis of sign language. The first level, the definition rules (DR), deal with definitions of terms used in the analysis and their relation to terms used in other language development studies. Within the framework established by the DR, the second level, the translation rules (TR), establish principles for 1) transcribing sign language using English glosses and 2) counting morpheme units in sign language. This makes possible the calculation of mean length of utterances (MLU), range count, and upper bound (Brown, 1973). These rules constitute a preliminary effort to describe sign language. They should not be regarded as either definitive or exhaustive.

## Basic Components of Sign Language

### Signs and Sign Units

In spoken language, a morpheme is considered to be the "minimal unit of syntax in a language, a unit from which words are formed" (Falk, 1973, p. 26). Morphemes are the smallest linguistic units which carry meaning.

The smallest describable units of sign language are the cheremes, described above. However, like phonemes, they are nonmeaningful units.

DR A: The minimal meaningful unit of sign language is the sign unit, defined as the smallest meaningful co-occurrence ($TD^{S}$) of tab (T), dez (D), and sig (s) cheremes. (A few bound sign units consist of a single chereme each [see

Compound and Complex Signs].) A change in any constituent chereme indicates a change in the meaning and identity of the whole unit. (Refer to Stokoe, et al., 1965, for a more detailed explanation.)

DR B: A sign unit is equivalent to a morpheme.

In the following examples, X, Y, and Z will represent sign units.

DR C: A sign is a symbol composed of one or more sign units.

In the following examples, A, B, and C will represent signs.

TR 1: In calculating MLU, range count, and upper bound, each sign unit will be counted as one sign unit (morpheme). (Exceptions are described in the appropriate translation rules.)

TR 2: In calculating MLU, range count, and upper bound for children, only one performance of a sign will be included if the sign is repeated without interruption or change of addressee.

A + A = 1 sign

Sign units are then counted according to TR 1.

NOTE: In adult sign language, repetition of a sign is often meaningful (Fischer & Gough, 1971). TR 2 was developed because children acquiring sign language often repeat signs without apparent significance. It is frequently impossible to determine whether or not the repetition is meaningful.

TR 3: If two performances of a sign are separated by a change of addressee, different sign, interruption, or utterance boundary (see DR Q), each performance will be included in calculating MLU, range count, and upper bound.

([ ] represents a change of addressee, interruption, or utterance boundary.)

A + [ ] + A = two signs

A + B + A = three signs

Signs units are then counted according to TR 1. If the sign is performed more than once either before or after the change of addressee, different sign, interruption, or utterance boundary, TR 2 applies.

A + A + [ ] + A + A = two signs

A + A + B + A + A = three signs

Fingerspelling (Dactylology)

The manual alphabet (fingerspelling) is a set of "digital symbols which stand in a one to one relationship with the letters of the English alphabet" (Stokoe, 1960, p. 23). This alphabet is generally used as a supplement to morphemic signs. Common two- and three-letter words, proper names, English words for which no sign exists, or words for which two signers have no common sign may be fingerspelled. In addition, many signs have as their dez one of the manual alphabet hand shapes. For example, name signs for familiar people often involve touching the

alphabetic hand shape for that person's initial to some part of the face or upper body. Such a sign is not recognized throughout the deaf community but has meaning within a family or a group of acquaintances.

DR D: Fingerspelling is the one to one correspondence of a digital symbol to a letter of the English alphabet or the ampersand.

TR 4: Fingerspelling

A. Fingerspelling will be transcribed with hyphens between the letters, e.g., s-w-i-n-g. Each complete fingerspelled morpheme of English will be counted as one sign unit. A fingerspelled morpheme will be regarded as complete, even if incorrectly or incompletely spelled, if the intended morpheme can be determined without ambiguity. Isolated fingerspelled letters without apparent meaning will not be counted in calculating MLU, range count, and upper bound.

s-w-i-n-g = one sign unit

c-a-t-s = two sign units

B. The fingerspelled a, used as an article, will be counted as one sign unit.

a + dog = two sign units

TR 5: Proper Names

Proper names are often signed by touching the hand configuration for the first letter of the name to some

part of the upper body. Fingerspelled letters indicating proper names will be transcribed in capitals. A proper name will be counted as one sign unit.

J (John) = one sign unit

J S (John Smith) = two sign units

NOTE: Words in parentheses are interpretations of the gloss.

Numbers

Numbers are similar to fingerspelling in that there is a one to one correspondence between the sign on the hand and the number intended.

Children sometimes learn number sequences by rote memorization, without understanding the number concepts. When a number sequence is produced by a young child, it is often impossible to determine whether the child knows the underlying concepts or not.

TR 6: Numbers

A. The signs for numbers from zero to ten and for twenty will each be counted as one sign unit. Numbers above ten, except twenty, will follow the conventions for compound signs. (See DR G, TR 13.)

3 = one sign unit

B. The performance of a sequence of numbers - e.g., 1-2-3-4, etc. - will be transcribed with hyphens between the numbers and will be counted

as one sign unit unless there is evidence (see below, TR 6C) that the child is using the numbers meaningfully. (This is an exception to TR 6A.)

1-2-3-4-5 = one sign unit

For an adult, each number of the sequence will be considered one sign.

C. If the child is counting specific objects or gives other indications that the counting is not rote, each number will be considered one sign.

Pointing (Indexic Reference)

The following rules are intended to differentiate among the various uses of pointing. The pointing action appears to be used with differential meaning (Hoffmeister & Moores, 1973). These meanings include a proximal-distal distinction (specific reference and location); singularity; plurality and conjunction (by multiple pointing); and personal and demonstrative pronouns. Multiple pointing directed toward a group of objects may indicate plurality. Pointing consecutively at different objects may denote conjunction.

TR 7: Pointing

A. Any pointing action, single or repeated, toward a single object is counted as one sign unit. Any multiple pointing action toward a group of objects is counted as two sign units. (Note: This is an exception to TR 2.) Each individual

pointing action consecutively presented, when directed at different objects not in a group, is counted as one sign unit.

pt. (book) = one sign unit

pt. pt. (book) = one sign unit

pt. pt. pt. (group of objects) = two sign units

pt. (cat) + pt. (dog) = two sign units

NOTE: TR 3 applies when pointing is interrupted.

B. Pointing actions when addressed to persons within the immediate environment are considered to be personal pronouns. These pointing actions follow TR 7A.

pt. (me) = one sign unit

pt. pt. (me) = one sign unit

Interjection "oh"

The interjection glossed as "oh" is semantically quite different from its closest English equivalent. The sign usually means "Oh, I understand" or "Oh, is that so"; it seldom functions as a semantically neutral filler.

TR 8: Interjection

The interjection sign glossed as "oh" will be counted as one sign unit.

Simultaneous Signs

In the language of signs, the sender can indicate two morphemes at the same time. One sign may be given on the left hand while a

different sign is given on the right hand. (See also TR 11.)

TR 9: Simultaneous use of signs

A. When one sign occurs on one hand and a different sign occurs on the other, they are considered to be two separate simultaneous signs. These will be transcribed as follows:

$\frac{A}{B}$ = two signs

$\frac{\text{cat}}{\text{pt.}}$ = two signs

B. TR 1 and TR 2 apply to repetitions of simultaneous sign combinations.

$\frac{\text{cat}}{\text{pt.}}$ $\frac{\text{cat}}{\text{pt.}}$ = two signs

TR 2 and TR 3 do <u>not</u> apply to a simultaneous sign combination which precedes or follows a performance of one of the component signs.

cat $\frac{\text{cat}}{\text{pt.}}$ = three signs

<u>Multiple-Gloss Signs</u>

TR 10: Multiple-gloss signs

When a sign having several possible distinctly different English glosses is used, all the possible glosses shall be listed in braces $\{\ \}$ and considered <u>one</u> sign.

$\left\{\begin{matrix}\text{bed}\\\text{sleep}\end{matrix}\right\}$ = one sign

<u>Negation and Affirmation</u>

Negation in sign language can be indicated in several ways: By a

simple shaking of the head to indicate "no," by fingerspelling, or by signs glossed as "no," "don't," "can't," "not," etc.

The negative head shake ($no^N$) may be the only negative sign in an utterance, or it may occur along with other negative signs. It may precede or follow the utterance it negates, or it may occur simultaneously with all or part of that utterance.

There are several affirmative signs having different glosses in English ("yes," "OK," "true," etc.) which may affirm the utterance much as negative signs negate it. The "yes" nod ($yes^N$), like $no^N$, can appear in various positions in the utterance, with or without other affirmative signs, and may be performed simultaneously with other sign units. Therefore, the same conventions will apply to the counting of negative and affirmative signs.

Affirmatives in sign have a number of other functions. For example, the sign glossed "true," which often functions as an affirmative, acts as the equivalent of "there is" in an existential sense.

TR 11: $No^N$ and $Yes^N$

A. $Yes^N$ and $no^N$ will each be counted as one sign unit. This is an exception to DR A in that $yes^N$ and $no^N$ are head movements, not manual signs, and so are not composed of tab, dez, and sign cheremes.

$yes^N$ = one sign unit

$no^N$ = one sign unit

B. $Yes^N$ and $no^N$ are both frequently performed simultaneously with other signs. When this occurs,

TR 8 applies.

$\frac{\text{No}^{N}}{A}$ = two signs

$\frac{\text{Yes}^{N}}{B}$ = two signs

C. Some signs having negative meanings are glossed with English contractions (can't, don't, won't). The signs themselves are not contractions, but single sign units.

can't = one sign unit

won't = one sign unit

Multiple-Word Glosses

TR 12: When the gloss for one sign consists of more than one English word, that gloss will be enclosed by quotation marks and will be considered one sign.

"turn around" = one sign

Compound and Complex Signs

In spoken languages, a free morpheme is one which can occur alone. A bound morpheme occurs only in combination with other morphemes. Sign language has both free and bound sign units.

DR E: A sign unit (e.g., dog, run) which can occur in isolation is a free sign unit.

DR F: A sign unit which occurs only in combination with other sign units is a bound sign unit. A bound sign unit may be composed of a single chereme.

Compound Signs

DR G: A sign composed of two or more free sign units is a compound sign.

Many compound signs consist of the simple co-occurrence, in linear order, of sign units which are meaningful in isolation. For example, the sign glossed as "today" is a compound composed of the sign unit for "now" and the sign unit for "day." "Teacher" consists of the sign units "teach" and "person." Other compounds have undergone change through cheremic assimilation. Thus, in formal usage "brother" is a compound of the sign units "boy" and "same." Although the two sign units do not have the same dez, in informal usage assimilation has occurred, and the first element of the compound has taken on the dez of the second element.

TR 13: Following Brown (1973, p. 54, rule #5), any compound sign will be counted as one sign unit in calculating MLU, range count, and upper bound for children.

brother = one sign unit

remember = one sign unit

teacher = one sign unit

In calculating MLU for adults, each component sign unit of a compound will be counted.

Bound Sign Units and Complex Signs

Common bound sign units include the comparative and superlative markers, which are closely equivalent to English -er and -est. These sign units have tab, dez, and sig but are performed only in combination with other sign units. A bound sign unit may, however, consist of a single chereme. For example, past or future time may be indicated by adding a sig (motion toward the signer for past; motion away from the signer for future) to the sign for a unit of time (week, year, etc.): "next week," "last year."

Although a free sign unit closely equivalent to English "not" exists, certain sign verbs can be negated by the addition of a sign unit which is semantically equivalent to "not" but formationally unrelated. This sign unit (sig only) consists of a pronating rotation of the hand, sometimes accompanied by motion away from the signer, which is added to or substituted for the sig of the stem sign. The following verbs may be negated in this way: "know," "like," "want," and, according to Woodward (1974), "have."

Some of the bound morphemes of English (-ed, -ing, -s, -ment, etc.) may be represented in sign language through fingerspelling or sign units, many of them recent coinages. Most of these representations of English forms are not in frequent use by the majority of deaf signers, although they may be used by deaf individuals who are fluent in English. These forms are commonly used in classes for the deaf and therefore appear in the sign language of some of the children in this study. A sign consisting of a stem sign plus a fingerspelled or signed representation of an English affix will be regarded as a complex sign (see DR K).

DR H: The sigs "motion toward signer" and "motion away from signer" (Stokoe et al., 1965) may be added to sign units indicating units of time (week, year, etc.) to signify past or future time. When so used, these sigs will be considered bound sign units.

DR I: Certain verb sign units may be negated by the addition of the sig "pronating rotation" (Stokoe et al., 1965). When so used,

this sig will be considered a bound sign unit.

NOTE: The addition of a sig, as described in DR H and DR I, may entail changes in the sig of the base sign unit.

DR J: Any fingerspelled or signed representation of an English bound morpheme will be considered a bound sign unit.

DR K: A sign composed of free and bound sign units is a complex sign.

TR 14: Following Brown (1973, p. 54, rule #8) each sign unit, free and bound, in a complex sign will be counted for calculating MLU, range count, and upper bound for children.

stronger = two sign units

dog -s = two sign units

"don't know" = two sign units

"next week" = two sign units

Embedded Sign Units

The sign units representing the numbers from 0 to 9 are atypical free sign units in that only their dez cheremes are significant. Their tab is neutral (Ø: "The space in front of signer's body where hand movement is easy and natural" Stokoe, 1960, p. 71.) and they have no sig (motion). In addition, there are two bound sign units, the reflexive and possessive pronoun inflections, which consist of dez only (A - dez and B - dez, respectively; see Stokoe et al., 1965).

In certain cases, a compound or complex sign may be formed by substituting the dez of a sign unit such as those described above for

the dez of another sign unit. Thus, the compound "two weeks" is formed by substituting the dez of the sign unit "two" for the dez of "week." The complex sign "my" results from the substitution of the dez indicating possessive meaning for the dez of the pronoun "me" (see TR 6B). In effect, one sign unit is embedded within another.

DR L: The dez B and A (see Stokoe et al., 1965), when used to add possessive and reflexive meaning, respectively, to pronouns, will each be considered a bound sign unit.

DR M: For certain sign units, the dez is either their only chereme or their only significant chereme. If one of these sign units is substituted for the dez of another sign unit, it is called an embedded sign unit. An embedded sign unit may be either free (e.g., number signs) or bound (e.g., possessive and reflexive markers).

DR N: A sign containing an embedded free sign unit will be considered a compound sign. Such a compound will be called a compound$^{E}$ (compound with embedding).

TR 15: A compound$^{E}$ will be counted in accordance with TR 13. An example of a compound$^{E}$ is "two weeks."

DR O: A sign containing an embedded bound sign unit will be considered a complex sign. Such a complex sign will be called a complex$^{E}$ (complex with embedding).

TR 16: A complex$^{E}$ will be counted in accordance with TR 14. Examples of complex$^{E}$'s include "my" and "myself."

NOTE: A complex sign may have a compound base. Thus, the complex sign "two weeks ago" involves the addition of the bound morpheme "past" (see DR G) to the compound[E] "two weeks."

Certain verb sign units can, by modification of the sig, be inflected for subject and object (e.g., show can become I show you) (Stokoe, et al., 1965, p. 281) or can incorporate location (look can become look over there) (Fischer & Gough, 1971). This process, which can create a full sentence from a single sign unit stem, is not strictly a morphological process but does involve both morphology and syntax. In this context, as Moores (1974) has pointed out, a young deaf child, operating with a single sign unit (e.g., show) can communicate sophisticated syntactic and semantic relationships (I show you, I show them, you show me, etc.).

However, in analyzing a child's language, it is often extremely difficult to determine with confidence whether such inflections and locatives actually are present in a given utterance. If we were to follow a tendency toward "rich interpretation" there would be a danger of reading too much into the children's utterances. If we were to ignore these constructions then important elements of the child's communication system would be deemphasized.

After serious consideration, and some very active disagreement, the authors decided to maintain their somewhat tenuous commitment to the Law of Parsimony, pending more intensive study of the question of modification of verb sign units, which will be presented at a

future date. Therefore an occurrence of such a verb will be transcribed in accordance with TR 12 and will be counted as a single sign unit.

Notation of Diglossia

In many cases, two or more signs exist which are semantically equivalent or nearly so. Often one sign occurs in more formal sign dialects and another in less formal ones.

TR 17: If distinct formal and informal signs exist for a single meaning, the English gloss will be followed by a raised "F" or "I" to indicate which form is used. If both forms are used in succession, each will be considered one sign.

$red^{I}$ + $red^{F}$ = two signs

Informal Interrogatives

TR 18: The same $TD^{s}$ occurs in the informal sign units glossed "$what^{I}$" and "$where^{I}$." When the $TD^{s}$ is accompanied by side-to-side head or eye movements, it will be glossed "$where^{I}$." When the $TD^{s}$ is not accompanied by the movements, it will be glossed "$what^{I}$." $What^{I}$ and $where^{I}$ will each be counted as one sign unit.

$what^{I}$ = one sign unit

$where^{I}$ = one sign unit

NOTE: This is an exception to DR A in that criteria other than tab, dez, and sig are used to define the sign unit.

Nonstandard Constituents

A $TD^{s}$ cannot be given for pantomime, as the movements involved in

pantomime cannot be analyzed into cheremic components. Pantomime therefore is not included in the definitions of sign unit and sign (DR A, B, C).

TR 19: Pantomime and Gestures

A. Pantomime, which cannot be broken down into identifiable constituent sign units, will not be counted in the computation of MLU, range count, or upper bound.

B. The boundary or distinction between a sign and a gesture has not been clearly defined in any of the literature to date. If a gesture is semantically unambiguous and can be transcribed as a single $TD^{S}$ in Stokoe's notation, it will be counted as one sign unit.

sh (quiet) = one sign unit

TR 20: Any nonstandard sign (other than a proper name) created by a subject to indicate a referent will be considered one sign and transcribed, underlined and placed in quotation marks. A description of the sign will be given in the margin of the transcript.

" x " = one sign

NOTE: Such signs were prevalent in the children's samples. These may be similar to the sounds or nonstandard "words" very young hearing children sometimes use to indicate familiar objects.

## Utterance Boundaries

The segmentation of sequences of signs into utterances is a difficult process. Clear-cut utterance boundaries exist when long pauses or attention devices (see TR 24) are used. However, often the only indication of an utterance boundary is a very brief pause in which the signer's hands relax somewhat and often drop below chest level.

DR P: Utterances

An utterance is a set of consecutive signs terminating with a pause that is long enough to indicate completion or terminating with an attention device (TR 23).

TR 21: Utterance boundaries are indicated with a dash as follows:

- X + Y + X - A + B + C - = two utterances

TR 22: Repetition of sign sequences

A. When an utterance consists of one sign sequence which is repeated, only the first occurrence of the sequence will be used in calculating MLU, range count, and upper bound.

NOTE: This rule only applies when the repetition or repetitions are identical to the original sequence. This rule does <u>not</u> apply when the phrase contains signs other than the repeated sequence.

- A + B + A + B - = two signs/one utterance

- me + want + me + want - = two signs/one utterance

- A + B + A + B + C - = five signs/one utterance

- me + want + me + want + cookie- =five signs/one utterance

B. If an utterance is repeated after interruption by a pause, attention device, or other utterance, or the addressee changes, the repeated utterance will be included in the calculation of MLU, range count, and upper bound.

- A + B + C - [ ] - A + B + C - = six signs

NOTE: An utterance repeated following a pause or interruption may or may not function as a new "sentence." Since the intention of the signer (in this case a child) cannot be definitely determined, an identical utterance repetition after a pause or interruption will be counted as a new utterance. The repeated utterance may act to bring the receiver back to where the signer had been prior to the pause or interruption.

TR 23: Incomplete utterances

Utterances containing one or more unintelligible signs will not be counted in calculating MLU, range count, or upper bound.

TR 24: Attention Devices:

Any attention-calling device will be transcribed but not counted as a sign unit. These devices—i.e., tapping someone's shoulder, banging on the floor, or waving arms--will be transcribed in square brackets.

[taps] = 0 sign units

## Computational Definitions

DR Q: Mean Length of Utterance (MLU)

The MLU is the average number of sign units per utterance. "Start with the second page of the transcription unless that page involves a recitation of some kind. In the latter case, start with the first recitation-free stretch" (Brown, 1973, p. 54). The first 100 utterances which satisfy the preceding translation rules are counted. Sign units are counted in accordance with these rules.

DR R: Range Count

The range count follows the above rule for MLU "but is always calculated for the total transcription, rather than for 100 utterances" (Brown, 1973, p. 54).

DR S: Upper Bound

The longest utterance per transcription is considered to be the upper bound (Brown, 1973, p. 54).

## Summary

Because the study of acquisition of sign language has been undertaken only in recent years and because analysis of a visual-motor communication system presents to some extent different problems than analysis of an auditory-vocal one, sets of rules by which the authors are analyzing their data are presented. Two levels of rules, involving various aspects of sign language structure, particularly morphology, are outlined:

a) Definition Rules. These rules deal with definitions of terms used in the analysis and their relation to terms used in other language development studies.

b) Translation Rules. These rules establish principles for transcribing sign language using English glosses and for counting morpheme units in sign language.

The rules have provided a framework for linguistic analysis in a project studying the acquisition of sign language by deaf children of deaf parents. It is within this framework that the results of the project should be interpreted. The authors believe that such an approach has facilitated comparison of sign language and spoken language acquisition. If this also proves to be of value to others involved in the linguistic study of sign language, it will be an added benefit.

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